

## A Rotary Grinding Machine

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Erfinder

Anmelder: ERSTE OFFENBACHER SPECIALFABRI [DE]

Klassifikation:

- Internationale:

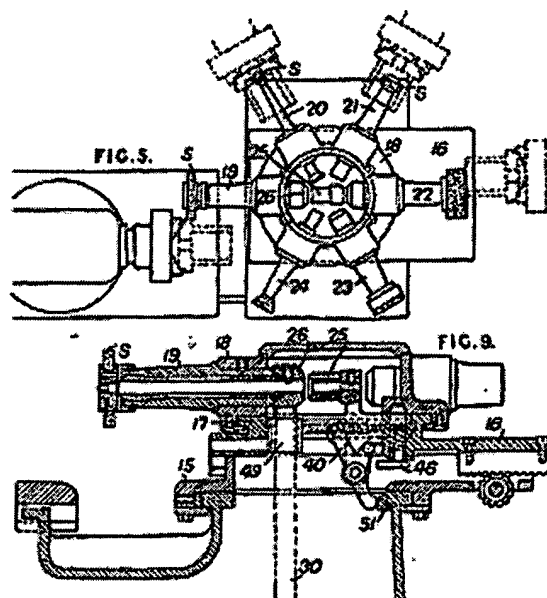
- Europäische: B24B27/00K

Aktenzeichen: GBD191222457 19121002

Prioritätsaktenzeichen: DEX191222457 19120327

### Zusammenfassung von GB191222457

22,457. Erste Offenbacher Specialfabrik f r Schmirgelwarenfabrikation Mayer & Schmidt. March 27, [Convention date]. Disk and wheel apparatus.-A rotary grinding-machine for exterior, interior, and plane grinding of rotating bodies comprises a number of grinding-spindles 19 ... 24 mounted upon a rotatable head 18 which may be turned to bring any one of the spindles into working position with its driving-pulley 26 adjacent to the free end of a loose central pulley 25. The head 18 is carried by a slide 16 upon which the loose pulley 25 is mounted and which also carries a lever 40. When the slide 16 is moved backward to remove a grinder s from the work, the lever 40 strikes a lug 51 on the machine frame and is turned about its pivot to move a belt-shifter 49 with the belt 30 from a grinder pulley to the loose pulley, and also to move a locking-bolt 46 and release the rotatable head, which may now be turned to present another grinder to the work. Reverse movement of the slide automatically locks the head 18 and shifts the belt 30 on to a grinder pulley. The grinder pulleys are coned at their free ends to enable the bolt to ride easily on to them. The slide 15 on which the slide 16 is mounted may be side-fed automatically or by hand.



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N<sup>o</sup> 22,457



A.D. 1912

*(Under International Convention.)*

Date claimed for Patent under Patents and Designs  
Act, 1907, being date of first Foreign Appli- } 27th Mar., 1912  
cation (in Germany),

Date of Application (in the United Kingdom), 2nd Oct., 1912

At the expiration of twelve months from the date of the first Foreign Appli-  
cation, the provision of Section 91 (3) (a) of the Patents and Designs Act,  
1907, as to inspection of Specification, became operative

Accepted, 2nd Oct., 1913

### COMPLETE SPECIFICATION.

#### A Rotary Grinding Machine.

We, the Firm ERSTE OFFENBACHER SPECIALFABRIK FÜR SCHMIRGELWAREN-  
FABRIKATION, MAYER & SCHMIDT, of Offenbach a/M, Germany, do hereby declare  
the nature of this invention and in what manner the same is to be performed,  
to be particularly described and ascertained in and by the following state-  
5 ment:—

In rotary grinding machines in order to avoid the waste of time in changing  
the grinding tools for effecting the various grinding operations it has been  
considered advantageous to provide a number of working or grinding spindles  
on a single grinding head.

- 10 These working spindles must, if they are to achieve their purpose, be so  
arranged that they can be easily guided to the work and withdrawn therefrom  
without bringing the other spindles into operation, and without the spindles,  
which are not in operation, being soiled by the lubricant or other substances,  
when one of the spindles is in operation. The arrangement must also be such  
15 that a different working spindle can be brought into operation without any  
appreciable loss of time.

- The present invention consists in that, means are provided, in a machine  
having a number of grinding spindles arranged in a rotatable head, whereby a  
driving belt may be brought automatically into use for the rotation of the  
20 grinding spindle in the operative position thereby greatly reducing the length  
of time occupied in bringing any particular grinding spindle into operation.

For the grinding spindles grinding wheels of various forms, polishing wheels  
and like tools may be provided which at the moment they are brought into the  
operative position are ready for use.

- 25 In the drawing

Fig. 1 shows the elevation of the machine,

Fig. 2 is a corresponding plan,

Fig. 3 is a side elevation from the right hand side of Fig. 1,

[Price 8d.]



*A. Rotary Grinding Machine.*

Fig. 4 is a side elevation from the left hand side,

Fig. 5 shows a plan view on a larger scale, of the rotatable head, the cover being removed,

Fig. 6 shows a section through the grinding head, to a larger scale,

Fig. 7 is a plan view of the tool rest, the rotatable head being removed,

Fig. 8 is an elevation of the tool rest, to a smaller scale, the rotatable head being removed, and

Fig. 9 is a section through the tool rest, rotatable head and the loose belt pulley, to a larger scale.

The machine consists of the box like bed 1 at the left hand end of which (Fig. 1) the slider 2 bearing the work support 3 is mounted. The slider has an automatic reciprocating movement which is secured by means of a change gear mounted in a casing 4. The reverse is effected and controlled by means of the stops 5, 6, and the reversing lever 7. In the drawing only one pair of stops is shown but it will be understood that the arrangement can be such that as many as six pairs of stops can be provided, that is a pair for each working or grinding spindle. The drive of the entire machine is effected from the shaft 8; the change gear in the casing 4 is driven by means of belt pulleys 9 and 10, and the belt drum 11, which is mounted in the bed 1; by belt pulleys or wheels which are not shown.

From the belt drum 11 the belt 12 passes to the belt pulley 13 of the work support 3 and imparts a rotary movement to the work holder 14. The work support 3 is, for the purpose of grinding conical parts, rotatably mounted on the slider 2.

At the other or right hand end of the machine the tool holder is also slidably mounted in such manner that the movement in an axial direction may be effected by hand, whereas the transverse movement can be effected by hand or automatically.

The tool rest consists of the support 15 which slides in guides provided on the bed and carries, slidably mounted upon it, a slider 16.

This slider 16 is provided at the upper side, with a circular guide or flange 17 on which the rotatable head 18 itself is mounted. In the latter as many as six working or grinding spindles, 19, 20, 21, 22, 23, 24 can be fitted.

The pulleys of these spindles are of different diameters so that they can be rotated at a different speed.

Those belt pulleys which are larger in diameter than the loose pulley 25 are on the outer side provided with bevelled or coned ends 26, 27, 28. Those belt pulleys which are smaller than the loose pulley 25 have raised edges 29 or ends coned in the reverse direction, so that it is possible to guide the driving belt on to or off the loose pulley 25.

The various working or grinding spindles are driven by a belt 30; the belt pulley 31 which imparts the drive to the spindles is mounted on an arm 32 so as to be capable of oscillation to permit the belt to be continually tensioned (Fig. 3). The belt pulley 31 is driven from the shaft 8 by means of the belt pulleys 33 and 34.

The driving belt pulley 35 is driven by mechanism outside the casing. Instead of the belt pulley 35 an electro-motor can be employed which would directly drive the shaft 8.

The loose pulley 25 is mounted at the centre of the rotatable head upon a bracket 36 provided on the slider 16. The loose pulley 25 and the bracket 36 are so disposed that the belt pulley of the working or grinding spindles do not strike against them on the rotation of the head.

The slider 16 can be moved by means of a rack 37, pinion 38 and hand wheel 39.

By the movement of this slider the following operations are effected automatically.

On withdrawing the grinding tool, 1, the working or grinding spindle is

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rendered inoperative as the driving belt is moved on to the loose pulley 25, and 2, the rotatable head is unlocked by the depression of the locking bolt.

On the advance of the grinding tool or its movement into the operative position,

3, the driving belt is moved on to the belt pulley of the working or grinding spindle which is in the operative position, and

4, the rotatable head is locked by the rising of the locking bolt.

Further, the mechanism can be such that on withdrawing the grinding tool

5, the rotation of the work is arrested,

6, the automatic longitudinal feed of the work can be arrested if, for example, the belt pulley 10 is provided as a loose and a fast pulley, or with clutch teeth, and, on withdrawing the tool, the belt 10' is moved on to the loose pulley or the clutch is disengaged; this movement can be effected through levers and rods by the slider 16.

On the forward movement of the tools the machine is automatically put into operation. The movements 1—4 take place as follows:—

When the slider 16 with the rotatable head 18 is moved to the right the lever 40 abuts with its arm 41 against the bar 51 cast on the bed, and rotates around the pivot 43 thus drawing the belt fork 49, which is slidably mounted in the slider 16, rearwards by means of the pin 44; the belt 30 is thus moved on to the loose pulley 25. At the same time the pin 42 of the lever 40 presses upon the plate 46 and draws the bolt 45 out of the hole 52 of the rotatable head 18; the head can now be rotated and a new tool can be brought into position for operation. On the forward movement of the slider and rotatable head the spiral spring 47 again presses the belt fork forwards and thus the belt is moved on to the belt pulley of the working or grinding spindle which is to be employed. The spiral spring 48 again raises the bolt 45 on the forward movement, and locks the head.

The bolt 43 is rotatably mounted in a lug 50 on the slider 16. The transverse adjustment of the tool holder is effected in the known manner by a spindle 53 and a hand wheel 54; the automatic movement is effected by ratchet wheel gearing and by the reversing lever through the rod 55 which oscillates a bell crank lever 56.

The pawl 57 rotates the ratchet wheel 58 and bevel pinion 59 and thus the bevel pinion 60; the worm 61 rotates the worm wheel 62, the sleeve of which is provided with an internal thread adapted to engage a thread on the spindle 53. If it is desired to effect the automatic transverse feed the spindle 53 is locked by means of the locking screw 63.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A rotary grinding machine for the exterior, internal, and plane grinding of rotating bodies having a rotary head with a number of working or grinding spindles, characterised by the provision of means whereby a driving belt may be brought automatically into use for the rotation of the spindle in the operative position, in the manner substantially as described.

2. A rotary grinding machine, according to Claim 1, characterised in that the belt pulleys which drive the working spindles are, according to the higher or lower rotary speed of the spindles, of various diameters, the belt pulley, according to its size, being provided with raised inclined edges or coned ends so as to permit of the convenient movement of the belt from the pulley of a working or grinding spindle on to the loose pulley and *vice versa*.

3. A rotary grinding machine, according to Claims 1 and 2, characterised in that by moving the slider 16 the belt 30 is, by means of the belt fork 49, moved on to the loose pulley 25, and the rotatable head is simultaneously unlocked,

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*A Rotary Grinding Machine.*

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by a pin 42, provided on a lever 40, which depresses a locking bolt 46 which is normally raised by a spring.

4. A machine, according to Claims 1 to 3, characterised in that on the forward movement of the rotatable head a spiral spring 47 moves the belt fork forwards and thus the belt 30 on to the belt pulley of the working or grinding spindle in position to be operated, whilst a second spring 48 presses the locking bolt 46 into a corresponding hole of the head to lock it. 5

5. A grinding machine substantially as described and as illustrated in the accompanying drawings.

Dated this 1st day of October, 1912.

10

EDWARD EVANS & Co.,  
27, Chancery Lane, London, W.C.,  
Agents for the Applicants.

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SHEET 1

(5 SHEETS)

SHEET 2

[This Drawing is a reproduction of the Original on a reduced scale.]

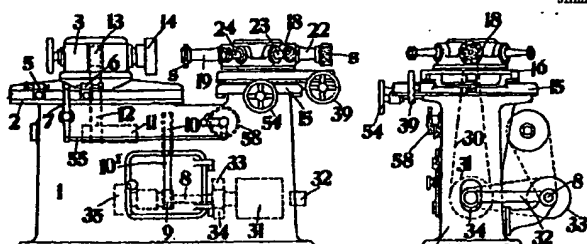


Fig. 1.

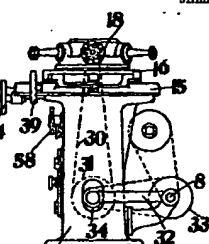


Fig. 3.

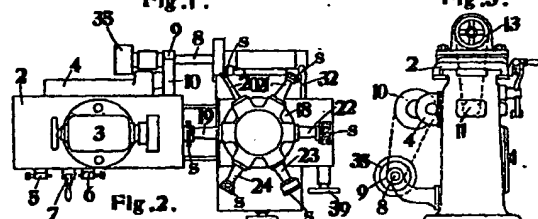


Fig. 2.

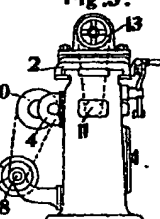


Fig. 4.

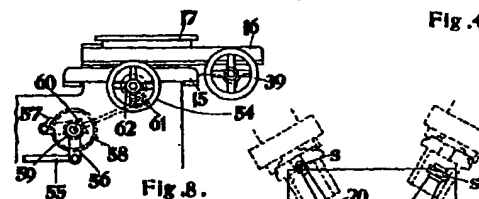


Fig. 8.

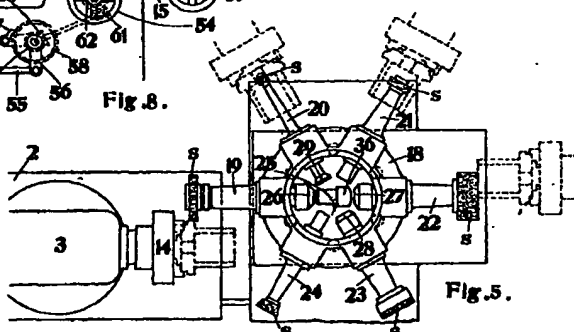


Fig. 5.

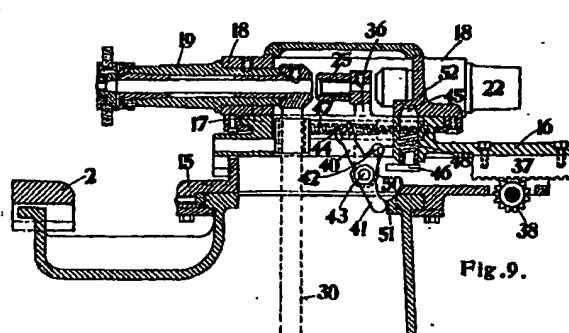


Fig. 9.

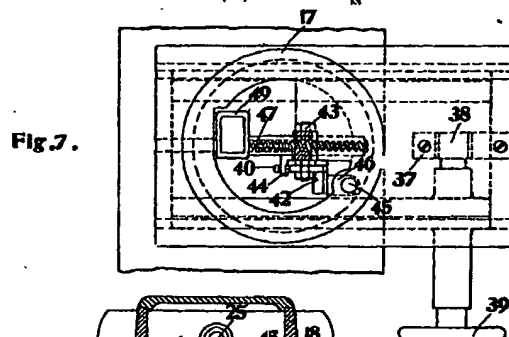


Fig. 7.

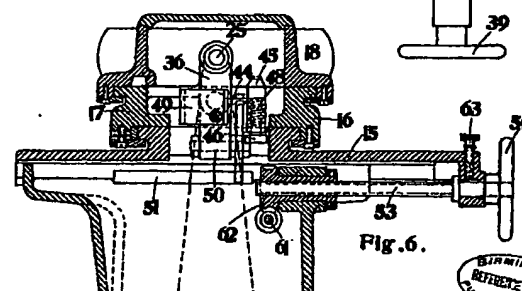


Fig. 6.



Muller & Sons, Photo-Litho.

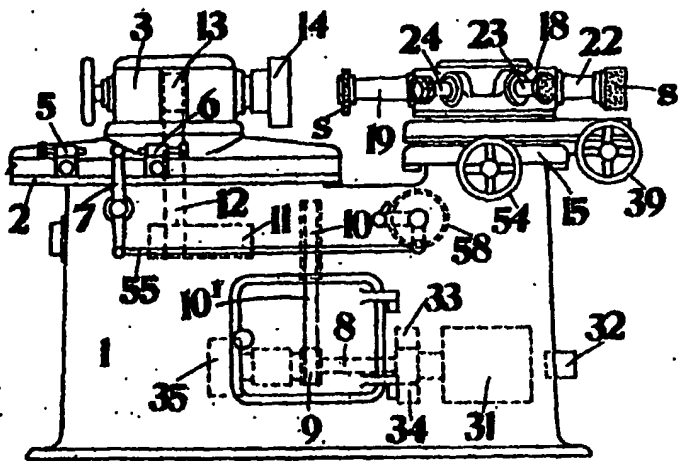


Fig. 1.

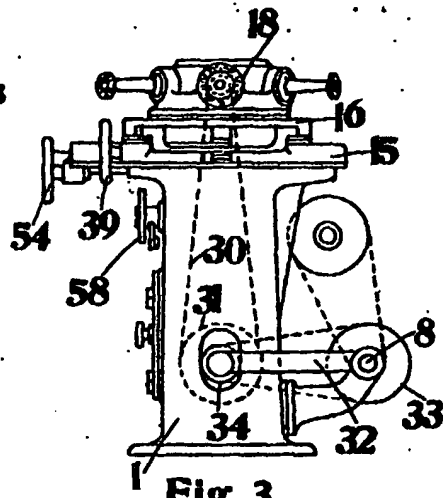


Fig. 3.

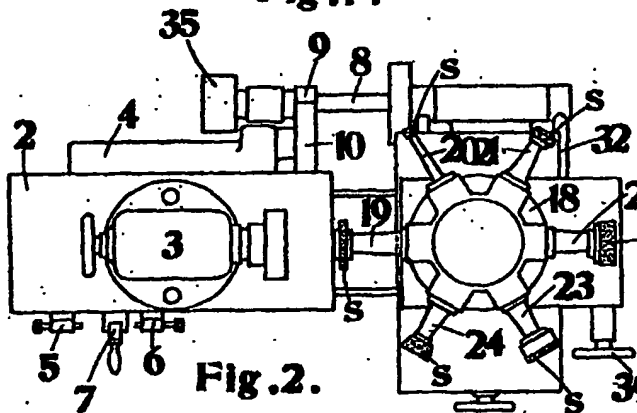


Fig. 2.

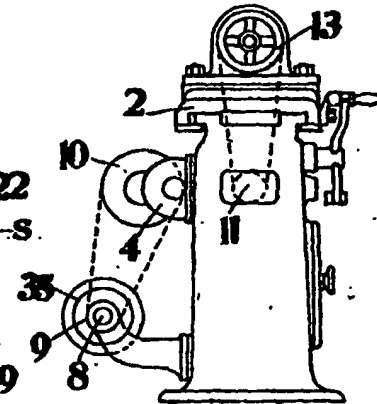


Fig. 4.

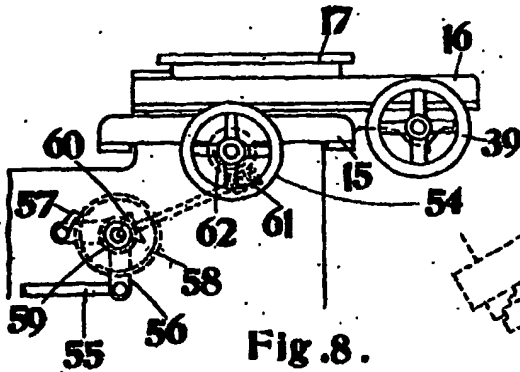


Fig. 8.

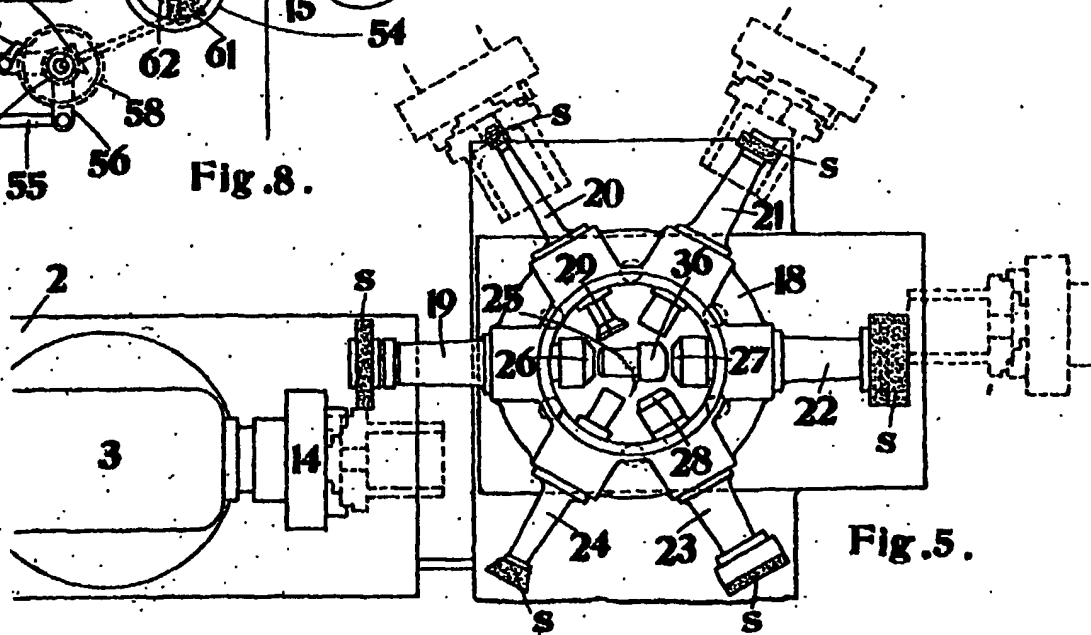


Fig. 5.

[This Drawing is a reproduction of the Original on a reduced scale.]

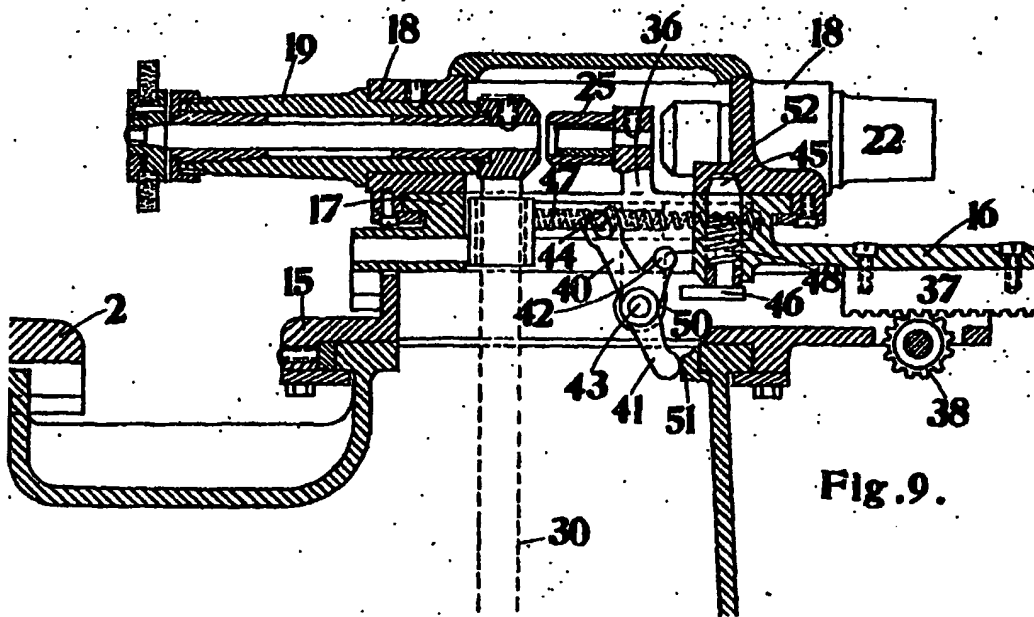


Fig. 9.

Fig. 7.

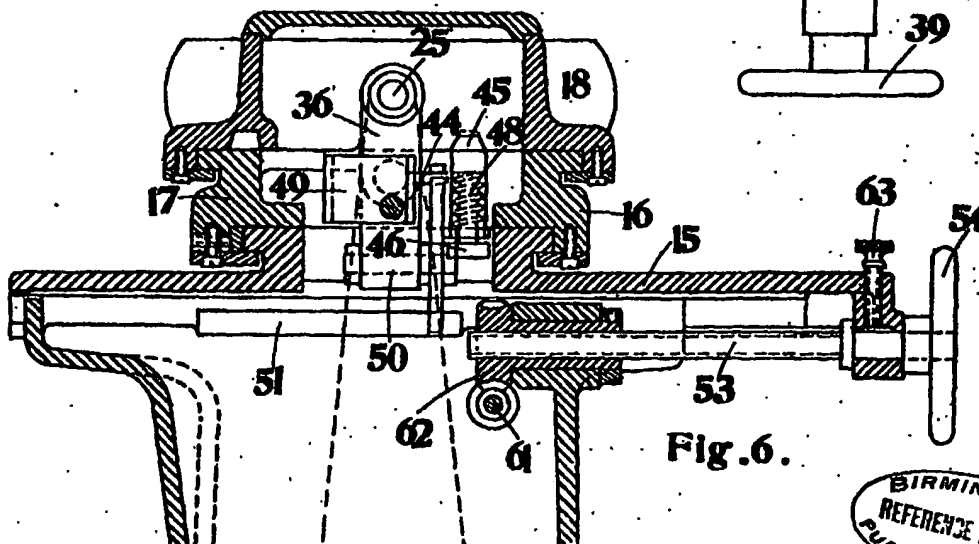
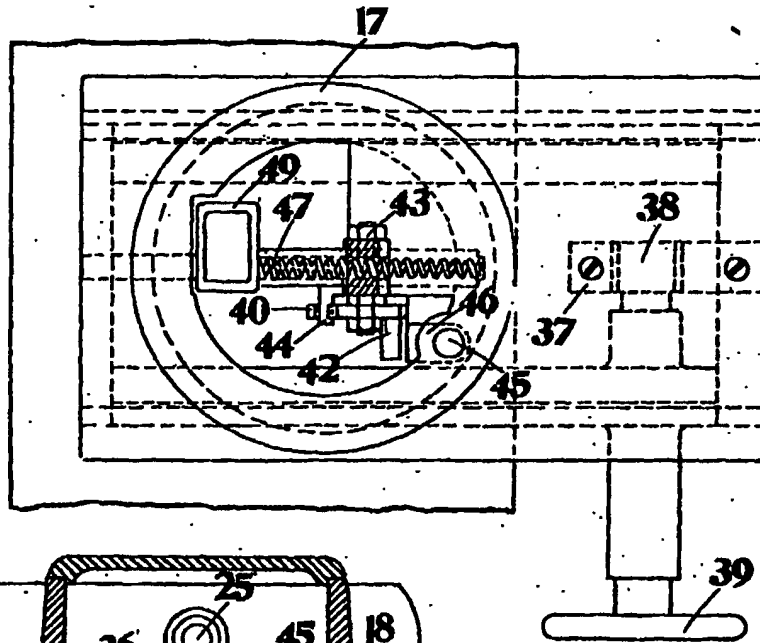


Fig. 6.

